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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Walter W. Mosher, Jr., Michael L. Beigel, and Thomas P. Mahoney

Serial No.:

Art Unit:

Filed:

Examiner:

For: IDENTIFICATION DEVICE HAVING REUSABLE TRANSPONDER

Box PATENT APPLICATION  
Hon. Commissioner of Patents and Trademarks  
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PATENT APPLICATION TRANSMITTAL LETTER

Sir:

Transmitted herewith for filing is the above-identified patent application. Also enclosed are:

- 2 sheets of drawings;
- 2 Assignments - one executed by each of two inventors and the second executed by the third inventor - to Precision Dynamics Corporation;
- a Check in the amount of \$40.00 for the recordation of the Assignments;
- a Patent Recordation Form Cover Sheet;
- 2 Declaration and Power of Attorney forms - one executed by each of two inventors and the second executed by the third inventor;
- a Check in the amount of \$872 for the application filing fee; and
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## 25

At the present time, identification devices such as wristbands or the like are widely used in hospitals to identify patients and to provide information regarding the

patients. Such wristbands are also utilized in various other applications, including prisoner identification and crowd control. Initially, such wristbands were confined to providing the bare minimum of the patient's name and,  
5 possibly, the nature of the patient's illness. Recently, such wristbands have been provided with encoded information in the form of bar codes or the like whereby considerable additional information about the patient can be ascertained, including such relevant data as medication, the patient's  
10 condition, or the like.

In utilizing such wristbands, bar code readers are provided to the nursing or other staff members and the nurse or other staff member reads the bar code before administering medication or performing various therapeutic measures.

15 While the use of bar codes or other encoded materials has constituted a considerable advance, once the bar code has been applied to the identification wristband, the alteration of the information on the wristband entails the substitution of a new wristband. In addition, because of  
20 physical limitations, the information imparted by bar codes or the like is necessarily limited.

A possible solution which would overcome the limitations of identification wristbands which are bar-coded or the like would be to provide an RF circuit in the wristband  
25 which would incorporate a semi-conductor circuit with logic, memory, and an RF circuit connected to an antenna capable of receiving and transmitting information so that a nurse or

other staff member carrying a transponder could query the RF circuit of the wristband to elicit a wide spectrum of information not presently available in conventional wristbands.

5               Unfortunately, available RF circuits are relatively expensive and, since conventional wristbands are disposable after use, such circuits would have to be discarded if they were integral components of the wristband.

10               Objects and Advantages of the Invention

              An object of the invention is the provision of an RF identification device which includes attachment means for attaching the RF identification device on a person or object to be identified and securement means for said attachment  
15               means whereby said attachment is retained in operative relationship with said person or object. For instance, the attachment means for hospital patient use can be in the form of a wristband and the wristband can be maintained in operative relationship with the wrist of the patient by  
20               securement means which holds the wristband on the patient's wrist, ankle or the like.

              The RF circuit is located in the securement means and, when the wristband is discarded, the securement means can be sterilized and reused, thus permitting the reuse of  
25               the RF circuit with the consequent economies resulting from such reuse.

Another object of the invention is the provision of an RF identification device of the aforementioned character wherein said attachment means incorporates an antenna and said securement means incorporates a transponder  
5 operatively connected to said antenna for receiving and transmitting information relating to the person or thing on which said attachment means is retained by said securement means.

A further object of the invention is the provision  
10 of an RF identification device in which said attachment means is constituted by the strap of an identification wristband and said securement means maintains said strap in operative relationship with a person or object to be identified.

Another object of the invention is the provision  
15 of an identification wristband incorporating an RF identification device, said wristband having an attachment portion constituted by an elongated strap and a securement means for maintaining said attachment portion in operative  
20 relationship with an object or person to be identified, said strap incorporating an antenna and said securement means incorporating a transponder operatively connected to said antenna whereby said wristband can receive and transmit signals imparting information regarding said person or  
25 object.

A further object of the invention is the provision of a wristband of the aforementioned character wherein said

securement means is demountably associated with said strap to permit said strap to be discarded and said securement means to be reused, thus permitting repeated utilization of said transponder in said securement means.

5           An additional object of the invention is the provision of a wristband of the aforementioned character wherein the securement means incorporates a complete RFID tag including the antenna so that the necessity for securing the RFID device to a separate antenna is eliminated.

10           Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawings.

#### Brief Description of the Drawings

15           Fig. 1 is a partially sectional view of a wristband strap or body demountably connected to the securement means therefor;

Fig. 2 is a partially sectional view of a wristband strap and securement means with the strap portion secured by the securement means;

20           Fig. 3 is a view showing an alternative securement means and securement means construction; and

25           Fig. 4 is a sectional view of the securement means disposed in operative relationship with the extremities of the attachment means.

### Preferred Embodiments of the Invention

Referring to the drawings, and particularly to Figs. 1-2 thereof, I show a portion of an identification  
5 wristband 10 which includes an attachment means 12 and a  
securement means 14. The securement means 14 is demountably  
secured to the attachment means 12 by a boss 16. The boss  
16 has a slightly enlarged upper extremity which is larger  
than the mating opening 17 provided in the adjacent  
10 extremity of the wristband 10.

Therefore, the opening 17 in the wristband 10 can  
be forced over the slightly enlarged extremity of the boss  
16 to hold the wristband in operative relationship with the  
securement means 14. However, when the use of the wristband  
15 by a patient or other person is finished, the wristband can  
be removed from operative relationship with the boss 16 by  
prying the extremity of the wristband 10 from operative  
engagement with the boss 16.

The attachment means is constituted by the strap  
20 or body portion 18 of the wristband 10, said body portion  
incorporating a space 22 between two laminae 24 and 26.

The structure and operation of the wristband 10  
are more fully described in U.S. Letters Patent No.  
5,479,797, the present description being limited to the  
25 incorporation in the securement means 14 of an RF circuit 30  
shown in phantom in Figs. 1 and 2 of the drawings. The  
securement means is fabricated by any suitable process from



synthetic plastic material. For instance, high-density polyethylene can be used to fabricate the securement means 14 by the injection molding process with the boss 16 formed as an integral component thereof. During the injection molding process an IC chip 30 or RFID module is molded into the securement means 14.

Alternatively, a receptacle can be formed in the securement means 14 and the IC chip 30 or RFID module can be located in the receptacle for reuse in conjunction with the securement means 14.

Formed in the space 22 between the laminae 24 and 26, is an antenna 33 which can be electrically connected to the IC chip 30 by conductive bosses 32 engaging corresponding conductors, not shown, on the antenna 33. The antenna 33 can be fabricated in conjunction with the fabrication of the wristband 10 by various methods including foil strips, the use of conductive inks or conductive wires. The showing in Fig. 1 is not intended to indicate the requisite length of the antenna 33 since this is determined by the characteristics of the IC chip 30 or RFID module.

The conductive bosses 32 can be fabricated in any desirable configuration and are not limited to the buss configuration shown in the drawings. For instance, the conventional cylindrical contacts can be substituted for the buss bar configuration.

Consequently, the securement means 14 can be separated from the strap or body portion of the attachment means

12 by disengaging it from the boss 16. The strap or body  
portion 18 of the attachment means 12 can be discarded and  
the securement means 14 can be sterilized and returned to a  
point of use, such as an admittance desk. At the admittance  
5 desk, when a patient is admitted, the IC chip 30 can be  
loaded with relevant data and associated with the attachment  
means 12 by forcing the opening 17 in the attachment means  
over the boss 16 of the securement means 14 to bring the  
contacts, not shown, of the antenna into engagement with the  
10 corresponding contacts 32 of the IC chip or RFID module 30.

Therefore, the continued repeated usage of the  
securement means 14 and the IC chip 30 materially reduces  
the per-patient cost of the RF identification device 10.  
Although the use of an antenna 33 in conjunction with the  
15 RFID module 30 has been disclosed, it is to be understood  
that a self-contained RFID module can be utilized with said  
module incorporating its own antenna, thus eliminating the  
necessity for providing an antenna, such as the antenna 33  
in the wristband 10.

20 Other than the conductive means between the  
antenna 33 and the chip 30, it is also possible to utilize  
the capacitative circuit disclosed in the co-pending  
application, Serial No. 60/040,143 filed March 10, 1997,  
entitled REACTIVELY COUPLED ELEMENTS IN CIRCUITS ON FLEXIBLE  
25 SUBSTRATES. The capacitative circuits of the two embodi-  
ments of that application can be applied with equal cogency  
to the RF circuit or chip 30.

Furthermore, the antenna 33 can also be incorporated in the securement means 14 if the design parameters of the circuitry permit.

5 An alternative form of RFID is shown at 40 in Figs. 3 and 4 of the drawings as including an attachment means 42 constituted by an elongated tubular strip or band 44 having an internal chamber 46 provided therein. The construction and mode of operation of the band 44 and the securement means 60 provided for usage therein are disclosed  
10 more fully in co-pending application Serial No. 08/787,757, filed January 28, 1997, entitled TUBULAR IDENTIFICATION WRISTBAND, the disclosures of which are incorporated herein by reference.

The securement means 60 is fabricated from a  
15 suitable synthetic plastic and has an RFID chip module 62 incorporated therein with a conductive contact or contacts 64 provided on the surface of the securement means 60 for engagement with one or more conductors of an antenna 66 located in the chamber 46 of the band or body 44.

20 The chip 62 is shown in Fig. 4 of the drawings with the opposite extremities 68 of the body 44 secured on the opposite extremities of the securement means 60.

Where an antenna 66 is used, it is located in one extremity of the chamber 46 and that extremity is marked to  
25 indicate the location of the extremity 68 of the band or body 44 which incorporates the antenna. The antenna 66 can also be imprinted or otherwise applied to the wall of the

chamber 46, if desired. The chip 62 is located internally of the securement means 60 and has a contact 64 engagable with a corresponding conductor, not shown, on the antenna 66.

5                   Therefore, when the securement means 60 and the attachment means 42 are assembled in the manner of Fig. 4, the chip 62 is electrically connected to the antenna 66 and the chip 62 and antenna can serve to receive and transmit signals in response to a suitably designed READER. When the  
10 patient is discharged from the hospital, the band or body 44 is disposed of for sanitary reasons and the securement means 60 can be sterilized and reused, thus achieving the economies incident to reuse of the chip 62.

                  In an alternative embodiment of the invention, a  
15 chip can be inserted in the internal chamber 46 of the tubular strip or band 44 of the attachment means 42. The chip can be associated with the identification card conventionally located in the chamber 46 as shown in the above-referenced application, Serial No. 08/787,757, filed  
20 January 28, 1997. In an alternative embodiment, a complete RFID tag with antenna can be incorporated into securement means 60.

                  Moreover, it is also possible to incorporate an RFID chip in the pocket of pocket-style wristbands such as  
25 that disclosed in U.S. Letters Patent 5,581,924. After the wristband has been utilized, the chip can be removed from the pocket and the wristband discarded. The chip can be

sterilized and re-used in the same manner as the chip of the previously-discussed embodiment of the invention.

The teachings of the invention relating to reuse of a significant component portion of an identification  
5 wristband or the like can be applied with equal cogency to a wide variety of devices to be attached to an object or person whose identity and other significant data must be detected for various reasons.

I CLAIM:

1. In a radio frequency identification device,  
the combination of:

5           disposable attachment means for locating said  
device on an object or individual to be identified; and  
radio frequency circuit means removably connected  
to said attachment means to permit reuse of said  
circuit means after disposal of said attachment means.

10           2. The device of claim 1 which includes  
securement means for said attachment means to maintain said  
attachment means in operative relationship with said object  
or individual, said securement means being demountably  
associated with said attachment means and said radio  
15 frequency circuit means being located in said securement  
means to permit the removal of said securement means from  
operative relationship with said attachment means for reuse  
of said securement means and said radio frequency circuit  
means with other attachment means.

20           3. The device of claim 1 in which said  
attachment means incorporates a receptacle integral with  
said attachment means for said radio frequency circuit  
means, said radio frequency circuit means being removable  
from said receptacle prior to discarding said attachment  
25 means.

4. The device of claim 1 in which said  
attachment means is a wristband locatable on the wrist of an

individual or an analogous portion of an object, said  
wristband having a receptacle formed integrally therewith  
for the reception of said radio frequency circuit means,  
said radio frequency circuit means being removable from said  
5 receptacle for reuse when said wristband is discarded.

5. The device of claim 1 in which said  
attachment means is a wristband securable in operative  
relationship with the wrist of an individual or an analogous  
portion of an object, said wristband having opposite  
10 extremities; securement means engagable with the opposite  
extremities of said wristband to maintain said wristband in  
said operative relationship and being removable from said  
extremities when said wristband is discarded; and RF circuit  
means located in said securement means for reuse with said  
15 securement means after said wristband has been discarded.

6. The device of claim 5 in which an antenna is  
located in said wristband and communicates with said RF  
circuit means when said securement means is operatively  
connected to said wristband.

20 7. In an RFID, the combination of:  
disposable attachment means having opposite  
extremities;  
securement means demountably connected to said  
opposite extremities of said attachment means for  
25 maintaining said attachment means in operative  
relationship with an object or individual to be  
identified; and

RFID circuit means located in said securement means and being removable with said securement means from said attachment means for subsequent use.

8. The device of claim 7 in which said  
5 attachment means is an identification wristband, one of whose extremities is demountably secured to said securement means, said securement means and radio frequency circuit means being reusable after having been dismounted from operative relationship with said one extremity of said  
10 wristband.

9. The device of claim 7 in which said  
attachment means is an elongated, hollow wristband having opposite extremities and said securement means has opposite extremities receivable in the opposite extremities of said  
15 wristband to maintain said wristband in operative relationship with the object or individual to be identified.

10. The device of claim 7 in which antenna means is located in said attachment means and communicates with said RF circuit means.

20 11. The device of claim 8 wherein an antenna is located in said hollow tubular wristband for communication with said circuit means in said securement means.

12. Reusable securement means having a body with securement portions thereupon, said securement portions  
25 being engagable with opposite extremities of disposable attachment means to locate said attachment means on an



object or individual, said body having RF circuit means located therein.

13. The securement means of claim 12 in which said body has opposite extremities engagable with said  
5 extremities of said attachment means.

14. The securement means of claim 12 in which said body incorporates a recess for the reception of said opposite extremities of said attachment means.

15. A securement means for a radio frequency  
10 device including a body with securement portions engagable with associated disposable attachment means, said securement means having an RF circuit incorporated therein to permit the reuse of said RF circuit.

16. The securement means of claim 15 wherein said  
15 securement portions are engagable with said attachment means to temporarily maintain said attachment means in said operative engagement.

17. The means of claim 16 in which said  
20 securement portions are on opposite extremities of said body and demountably engagable with said attachment means.

18. The means of claim 16 in which said body incorporates an attachment receiving recess to maintain said attachment means in said operative engagement.

### Abstract Of The Disclosure

A radio frequency identification device includes attachment means which is maintained in operative relationship with an object or individual by securement means. The attachment means is disposable and the securement means is easily separable therefrom for reuse, the securement means including a radio frequency identification circuit which can be reused after the attachment means has been disposed of. One form of the radio frequency identification device is an identification wristband which incorporates attachment means and securement means for said attachment means, the securements means incorporating an RFID such as a chip which is removed from operative relationship with the attachment means when the securement means is removed to permit reuse of the securement means and chip.

## DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled IDENTIFICATION DEVICE HAVING REUSABLE TRANSPONDER, the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

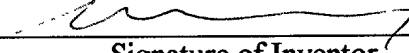
**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorneys: (1) to prosecute this application and any and all divisions, reissues, extensions, continuations, or continuation-in-parts thereof, as well as any and all international and foreign counterparts thereof, in the United States and throughout the world; (2) to represent

me and transact all business connected therewith in the United States Patent and Trademark Office and any and all competent International Authorities; and (3) to make or receive payments on my behalf in connection therewith:

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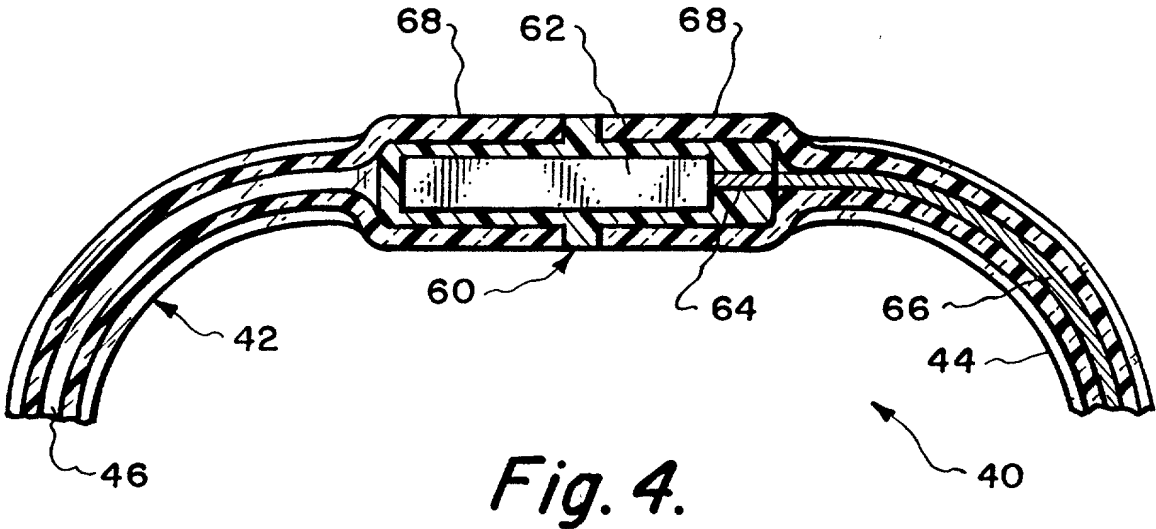
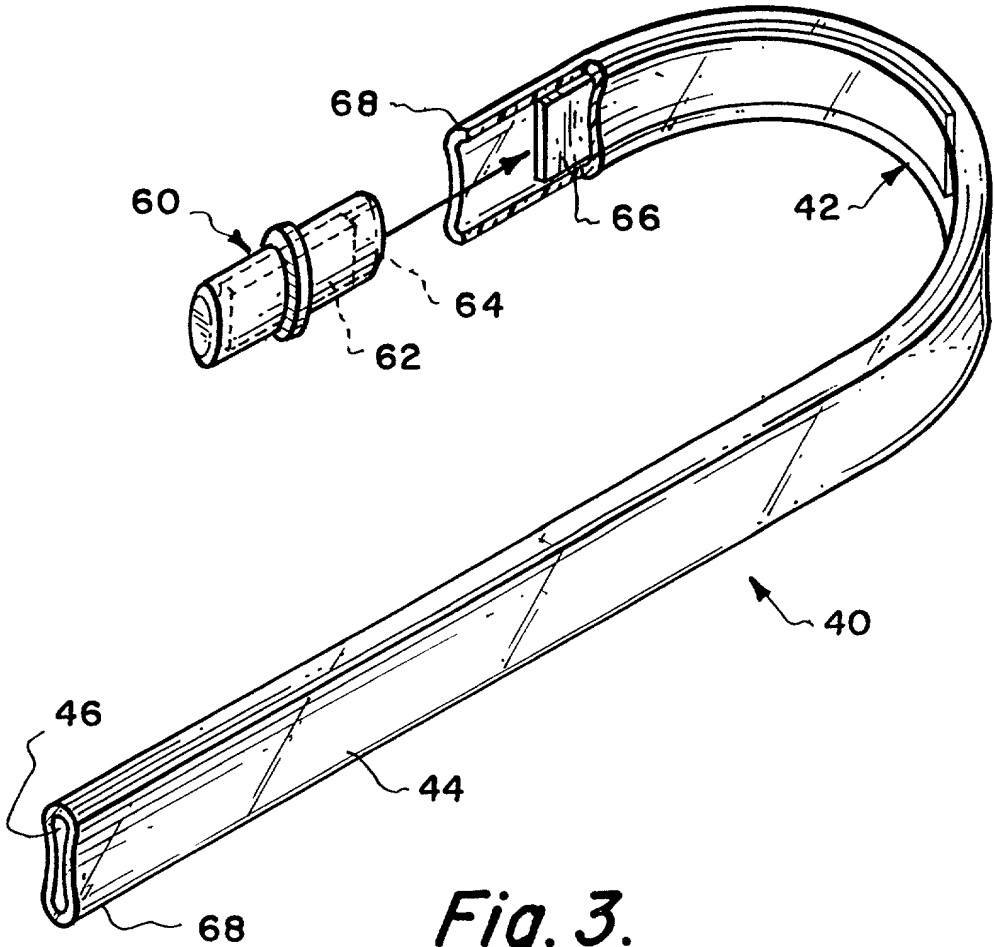
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## **DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled IDENTIFICATION DEVICE HAVING REUSABLE TRANSPONDER, the specification of which is attached hereto.

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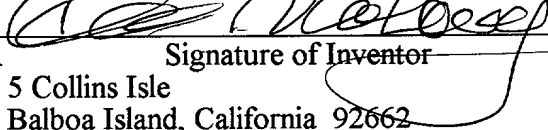
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